

REMARKS

Applicants submit this Reply to the Office Action mailed June 24, 2008. By this Reply, Applicants have amended claim 14. Claims 1-13, 28, 30, 37, and 38 were previously canceled without prejudice or disclaimer of their subject matter. Accordingly, claims 14-27, 29, 31-36, and 39 remain pending in this application, among which claim 14 is independent. The originally-filed application fully supports the subject matter of the amendment to claim 14. Thus, no new matter is introduced.

In the Office Action¹, the Examiner took the following actions: (1) rejected claims 14-16 under 35 U.S.C. § 103(a) as being unpatentable over Ueda (U.S. Patent No. 6,122,009) ("Ueda") in view of Hajime Oge (JP Patent No. 409312808A) ("Oge"); (2) rejected claim 39 under 35 U.S.C. § 103(a) as being unpatentable over Ueda, Oge and in further view of Ikeda (U.S. Patent No. 5,783,815) ("Ikeda"); (3) rejected claims 17 and 21-27 under 35 U.S.C. § 103(a) as being unpatentable over Ueda in view of Oge; (4) rejected claims 18-20 and 31-36 under 35 U.S.C. § 103(a) as being unpatentable over Ueda, Oge and in further view of Toyoda et al. (U.S. Patent Application Publication No. 2001/0012073) ("Toyoda"); (5) rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Ueda, Oge, Toyoda and in further view of Basista et al. (U.S. Patent No. 4,451,124) ("Basista").

Applicants respectfully traverse these rejections above and respectfully request reconsideration for at least the reasons provided below.

¹ The Office Action contains statements characterizing the related art and the claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

Rejection of Claims 14-16 Under 35 U.S.C. § 103(a)

Claims 14-16 stand rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Ueda in view of Oge. Applicants respectfully traverse this rejection.

According to claim 14, the “image pickup element” includes “a plate mounted on a top surface of the base board, the plate having a thickness and a top surface,” “a peripheral top surface formed on the top surface of the plate,” and “a leg section to support the lens section and a contact surface provided at a lower end of the leg section, the contact surface resting on only the peripheral top surface of the plate such that the lower end of the leg section does not extend beyond the top surface of the plate” (emphasis added).

In the Office Action, the Examiner asserted that “the peripheral top surface is read as wherein the leg section of the lens rests and where terminals to connect the CCD 12 are located.” Office Action, p. 3. Applicants do not agree with the Examiner’s interpretation of the “peripheral top surface” recited in claim 14. It is clear from claim 14 that the “peripheral top surface” is formed on the top surface of the plate. The plate has a thickness, and is “mounted on a top surface of the base board.” Therefore, the “peripheral top surface” and the “top surface of the base board” are two distinctive elements recited in claim 14. The “peripheral top surface” should not be read in such a way, as adopted by the Examiner, to include portions of the top surface of the base board where the leg section of the lens rests, as shown in Fig. 45 of Ueda.

Claim 14 also recites “an optical member including a lens section to form an image of an object on the photoelectrically converting section of the plate, a leg section to support the lens section and a contact surface provided at a lower end of the leg

section, the contact surface resting on only the peripheral top surface of the plate such that the lower end of the leg section does not extend beyond the top surface of the plate" (emphasis added). The Office Action referred to Fig. 45 of Ueda for its alleged disclosure of above features. Applicants submit that Fig. 45 of Ueda merely teaches that the leg portion 62 of the image forming lens 54 rests on the top surface of the substrate 51, but not on the top surface of the CCD bare chip 12. Therefore, the arrangement of the image forming lens 54 shown in Fig. 45 of Ueda is clearly different from the arrangement of the optical member recited in claim 14. Applicants submit that Fig. 45 of Ueda does not teach or suggest "the contact surface resting on only the peripheral top surface of the plate such that the lower end of the leg section does not extend beyond the top surface of the plate," as recited in claim 14.

The Office Action alleged that "Ueda teaches in another embodiment (figure 41) an image pick up element (CCD 12) including a plate mounted on the base board (CCD 12 is mounted on a substrate 51 via a plate)" See Office Action, p. 2, "Examiner's response." Applicants do not agree. As shown in Fig. 41 of Ueda, the leg portion 62 of the image forming lens 54 rests partially on the top surface of the CCD bare chip 12. A portion of the lower end of the leg portion 62 does not rest on the top surface of the CCD bare chip 12, but instead extends beyond the top surface of the CCD bare chip 12 toward the substrate 51. See Fig. 41 of Ueda. Therefore, Fig. 41 of Ueda fails to teach or suggest "the contact surface resting on only the peripheral top surface of the plate such that the lower end of the leg section does not extend beyond the top surface of the plate," as recited in claim 14 (emphasis added).

Claim 14 also recites that the “optical member is mounted on the image pickup element such that a first position between the lens section and the photoelectrically converting section of the image pickup element in an optical axis direction is determined by resting the contact surface of the optical member on only the peripheral top surface or with a top surface member when the top surface member is provided on the peripheral surface” (emphasis added). Applicants submit that because of the recited arrangement, e.g., the contact surface of the optical member being mounted on only the peripheral top surface of the plate, the claimed structure may suppress or reduce deviations in the optical axis direction between the photoelectrically converting section and the image forming point of the lens section. See the Specification at, for example, p. 38, line 1 through p. 39, line 1.

To better understand the advantage of the arrangement recited in claim 14, let us examine the structure disclosed in Fig. 45 of Ueda. For example, if there was any error in the thickness of the CCD bare chip 12, the error would induce deviation between the image forming point of the image forming lens 54 and the photoelectrically converting section contained in the CCD bare chip 12. The deviation may be difficult to suppress or correct because the leg portion 62 of the image forming lens 54 rests on the top surface of the substrate 51 instead of on the top surface of the CCD bare chip 12. In contrast, with the structure of the present invention as recited in claim 14, since the optical member is mounted on the image pickup element, the error in the thickness of the image pickup element would not affect the relative position between the image forming point of the optical member and the photoelectrically converting section. Therefore, the “first position between the lens section and the photoelectrically

converting section of the image pickup element in an optical axis direction,” as recited in claim 14, may be accurately determined, which may improve image quality.

Claim 14 further recites “a lens frame having a slidable contact surface at a lower end thereof,” and that “the lens frame is mounted on the base board such that a second position between the lens section and the photoelectrically converting section of the image pickup element in a direction perpendicular to the optical axis is determined by bringing the slidable contact surface of the lens frame in direct contact with only the top surface of the base board and by positioning the slidable contact surface of the lens frame on the base board” (emphasis added). Ueda fails to teach or suggest above feature. See Office Action, p. 6. The Office Action relied on Oge to cure the deficiency of Ueda, and alleged that “Oge teaches a lens structure 3 as shown in figure 4 that is moved in the X-Y direction to the CCD chip 2 on a substrate (see figures 1-5)” The Office Action further alleged that it would have been obvious for one of ordinary skills in the art at the time of the invention to combine the teachings of Ueda and Oge and arrive at the claimed invention. Office Action, p. 6. Applicants respectfully disagree.

Even if one of ordinary skills in the art had combined the teachings of Ueda and Oge, the combination would not have arrived at the claimed invention of the present application. For example, even if one of ordinary skills in the art had combined the teachings of Oge with the teachings of Fig. 41 of Ueda, although the lens structure 3 of Oge may be moved in the X-Y direction, the movement of the lens structure 3 would be limited by the image forming lens 54, which would be attached to the lens structure 3 and would be moved together with the lens structure 3. This is because the leg portion 62 of the image forming lens 54, as shown in Fig. 41 of Ueda, is partially located on the

top surface of the CCD bare chip 12, and the portion extending beyond the top surface of the CCD bare chip 12 would confine the movement of the image forming lens 54 in the X-Y direction. As a result, if there was any sufficiently large deviation in the X-Y direction between the image forming point of the image forming lens 54 and the photoelectrically converting section in the CCD bare chip 12, the deviation may not be corrected or suppressed by moving the lens structure 3 in the X-Y direction due to the confinement of the extended portion of the leg portion 62. Therefore, the combination of the teachings of Oge with the teachings of Ueda suggested by the Office Action would not have arrived at the claimed invention recited in claim 14. Thus, the teachings of Oge does not cure the deficiencies of Ueda.

Finally, according to present invention, the alignment between the image forming point and the photoelectrically converting section is determined by two positions between the lens section and the photoelectrically converting section. The first position in the direction of the optical axis and the second position in the direction perpendicular to the direction of the optical axis are determined by two different contacts respectively. The first position is determined by a first contact between the contact surface of the optical member and the peripheral top surface, and the second position is determined by a second contact between the slidable contact surface of the lens frame and a top surface of the base board. With the structure of the present invention, it is easier to determine the first position and the second position for accurate alignment of the image forming point and the photoelectrically converting section. As a result, better image quality and a greater degree of freedom in designing the image pickup device can be achieved.

However, Ueda and Oge, taken alone or in combination, merely teach that the first position and the second position are determined by only a single contact between either a lens frame and a CCD bare chip, or a lens frame and a substrate. See Figs. 41 and 45 of Ueda and Fig. 4 of Oge. Neither Ueda nor Oge teaches or suggests a structure where the first position and the second position are determined by two different contacts, i.e., the first contact between the contact surface of the optical member and the peripheral top surface and the second contact between the slidable contact surface of the lens frame and a top surface of the base board.

Therefore, Ueda and Oge, taken alone or in combination, fail to teach or suggest each and every feature of claim 14. Claim 14 thus should be allowed. Dependent claims 15-16 also should be allowed at least by virtue of their dependency from claim 14. Applicants therefore respectfully request withdrawal of the rejection of claims 14-16 under 35 U.S.C. § 103(a).

Rejection of Claim 39 Under 35 U.S.C. § 103(a)

Claim 39 stands rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Ueda, Oge and in further view of Ikeda. As established above, Ueda and Oge, taken alone or in combination, fail to teach or suggest each and every feature of claim 14. Applicants submit that Ikeda also fails to teach or suggest the above-discussed features recited in claim 14, which are not taught or suggested in Ueda and Oge. Accordingly, Ikeda does not cure the deficiencies of Ueda and Oge. Ueda, Oge, and Ikeda, taken alone or in combination, fail to teach or suggest each and every feature of claim 14. Therefore, claim 14 should be allowed. Claim 39 also should be

allowed at least by virtue of its dependency from claim 14. Applicants respectfully request withdrawal of the rejection of claim 39 under 35 U.S.C. § 103(a).

Rejection of Claims 17 and 21-27 Under 35 U.S.C. § 103(a)

Claims 17 and 21-27 stand rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Ueda in view of Oge. Applicants respectfully traverse this rejection. As established above, Ueda and Oge, taken alone or in combination, fail to teach or suggest each and every feature of claim 14, and therefore claim 14 should be allowed. Accordingly, claims 17 and 21-27 should be allowed at least by virtue of their dependency from claim 14. Applicants therefore request withdrawal of the rejection of claims 17 and 21-27 under 35 U.S.C. § 103(a).

Rejection of Claims 18-20 and 31-36 Under 35 U.S.C. § 103(a)

Claims 18-20 and 31-36 stand rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Ueda, Oge and further in view of Toyoda. Applicants respectfully traverse this rejection. Notwithstanding Toyoda's alleged disclosure of features recited in claims 18-20 and 31-36, which Applicants do not concede, Applicants submit that Toyoda fails to teach or suggest at least the above-discussed features recited in claim 14, which are not taught or suggested in Ueda and Oge. Therefore, Toyoda fails to cure the deficiencies of Ueda and Oge. Ueda, Oge, and Toyoda, taken alone or in combination, fail to teach or suggest each and every feature of claim 14. Accordingly, claim 14 should be allowed. Claims 18-20 and 31-36 also should be allowed at least by virtue of their dependency from claim 14. Applicants therefore respectfully request withdrawal of the rejection of claims 18-20 and 31-36 under 35 U.S.C. § 103(a).

Rejection of Claim 29 Under 35 U.S.C. § 103(a)

Claim 29 stands rejected under 35 U.S.C. § 103(a) as being purportedly unpatentable over Ueda, Oge, Toyoda and further in view of Basista. Notwithstanding Basista's alleged disclosure, which Applicants do not concede, Applicants submit that Basista fails to teach or suggest at least the above-discussed features recited in claim 14 that are not taught or suggested by Ueda, Oge, and Toyoda. Therefore, Basista fails to cure the deficiencies of Ueda, Oge, and Toyoda. Accordingly, Ueda, Oge, Toyoda, and Basista, taken alone or in combination, fail to teach or suggest each and every feature of claim 14. Therefore, claim 14 should be allowed. Claim 29 also should be allowed at least by virtue of its dependency from claim 14. Applicants respectfully request withdrawal of the rejection of claim 29 under 35 U.S.C. § 103(a).

Conclusion

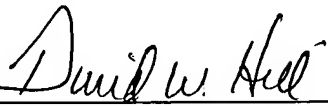
In view of the foregoing remarks, Applicants submit that this claimed invention, as amended, is not rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge
any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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